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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/071,456

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David L. Dickerson

MI22-1943

9958

21567

7590

03/14/2005

WELLS ST. JOHN P.S.

601 W. FIRST AVENUE, SUITE 1300

SPOKANE, WA 99201

EXAMINER

MAI, ANH D

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/071,456

Applicant(s)

DICKERSON ET AL.

Examiner

Anh D. Mai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 69,70 and 73-81 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 69,70 and 73-81 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/24/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Status of the Claims*

1. Amendment filed February 8, 2005 has been entered. Claim 71 has been canceled. Claims 69 and 77 have been amended. Claims 80 and 81 have been added. Claims 69-70 and 73-81 are pending.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 69-70 and 73-81 are rejected under 35 U.S.C. 102(b) as being anticipated by K. Ohe et al. Narrow-Width Effects of Shallow Trench-Isolated CMOS with n+ Polysilicon Gate.

With respect to claim 69, Ohe teaches a semiconductor construction as claimed including:

a semiconductor substrate (silicon) having a trench extending partially therein and upper surfaces formed adjacent the trench;

an oxide layer (gate oxide) formed over the upper surfaces of the semiconductor substrate and having an uppermost surface;

an insulative material (oxide) at least partially filling the trench and having a portion extending outward of the trench and the semiconductor substrate, the portion comprising an outermost upper surface formed elevationally above the uppermost surface of the oxide layer and

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sidewalls connecting the outermost upper surface with the oxide layer, the sidewalls comprising first and second curved segments, the first curved segment extending from the outermost upper surface and comprising a first apex directed away from the semiconductor substrate, and the second curved segment extending from the first curved segment to the oxide layer and comprising a second apex directed toward the semiconductor substrate, the second apex being elevationally at or above the upper most surface of the oxide layer, an entirety of the insulative material (oxide) comprising the same stoichiometry, and wherein the outermost upper surface of the portion comprises a substantially planar surface; and

a polysilicon layer (n+ polysilicon gate) formed against the uppermost surface of the oxide layer and against the portion of the insulative material. (See Figs. 2, 6 and 9).

With respect to claim 70, the insulative material of Ohe comprises oxide.

With respect to claim 73, the trench of Ohe comprises sidewalls connected by a bottom wall, and wherein the first curved segments of the portion are elevationally above and between the sidewalls of the trench (4).

With respect to claim 74, the trench of Ohe comprises sidewalls connected by a bottom wall, and the first curved segments of the portion are directly over the bottom wall of the trench.

With respect to claim 75, the trench of Ohe comprises sidewalls intersecting the upper surfaces of the semiconductor substrate, the intersection being positioned elevationally directly below the second curved segment of the portion of the insulative material.

With respect to claim 76, the trench of Ohe comprises sidewalls extending substantially perpendicular relative the upper surfaces of the semiconductor substrate.

With respect to claim 77, the trench of Ohe comprises sidewalls connected by a bottom wall, and wherein the sidewalls are formed substantially at right angles with the bottom wall.

With respect to claim 78, the polysilicon layer of Ohe directly contact the sidewalls of the portion of the insulative material.

With respect to claim 79, the polysilicon layer of Ohe directly contact the sidewalls and the outermost upper surface of the portion of the insulative material.

With respect to claim 80, the upper surfaces of the semiconductor substrate of Ohe are substantially planar surfaces, and wherein the upper surfaces are substantially parallel with the outermost upper surface of the portion of the insulative material.

With respect to claim 81, the uppermost surface of the oxide layer of Ohe is substantially planar, and wherein the uppermost surface is substantially parallel with the outermost upper surface of the portion of the insulative material.

### *Response to Arguments*

3. Applicant's arguments with respect to claim 69 have been considered but are moot in view of the new ground(s) of rejection.

Note that the term “convex” of Tseng is referring to rounded edges of the trench fill material. It is well known in the art that the electric field is reduced on the rounded edges as compares the square edges.

Also note that, the trench feature of the instant Fig. 21 is also known as “convex”.

However, since new reference is applied, the argument with respect to “convex” is moot.

*Conclusion*

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh D. Mai whose telephone number is (571) 272-1710. The examiner can normally be reached on 9:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

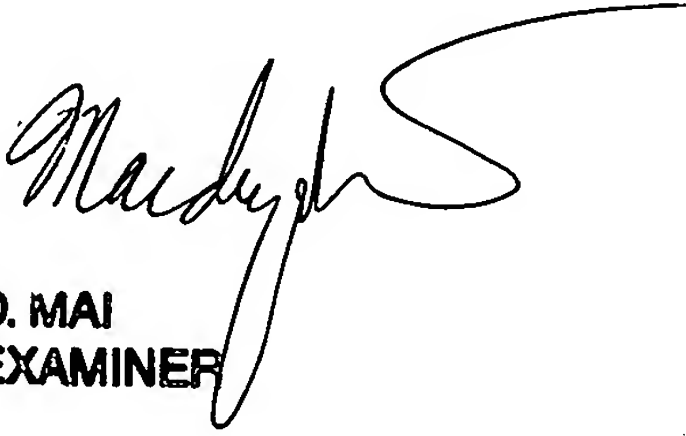
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Anh D. Mai', with a large, sweeping flourish extending to the right.

**ANH D. MAI  
PRIMARY EXAMINER**

March 9, 2005